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ABSTRACT

The purpose of this study was the examination of the field-dependent cognitive style as it relates to differences in learning within an analytical, concept-based physical education curriculum. Subjects were 52 elementary school students in the second grade who scored in the fourth quartile on the Children's Group Embedded Figures Test. Observation and interview data were collected over a 4-month period. A field note journal was used to record events which occurred during the observation period. An interpretive journal was developed from concerns or interpretive comments made by investigators at weekly meetings. At the end of the observation period, formal interviews were conducted with students and teachers who had been selected for expertise in teaching the Logsdon curriculum, a kinesiology-based approach to physical education. Teacher interviews focused on plans for the organization of the class, efforts to structure material for student learning, and perceptions of differences in student learning. Student interviews concerned the children's attitudes toward physical education and the relevance of the content to them. Data were analyzed using constant comparison. Results suggested that field-dependent students experienced difficulty focusing on lesson discussion, following directions, and working independently. Discussion concerns the role of structure and the influence of social relationships on learning behaviors of field-dependent children. (RH)

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Characteristics of Field-Dependent Children in Instructional Settings

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Abstract

The purpose of the research was the examination of the field-dependent cognitive style as it relates to differences in learning within an analytical curriculum. Subjects consisted of 52 children scoring in the 4th quartile on the Children's Embedded Figures Test. Observation and interview data were collected by the two investigators over a four-month period. Data were analyzed using constant comparison. Results suggested that field-dependent students experienced difficulty focusing on lesson discussion, following directions, and working independently. The discussion focused on the role of structure and the influence of social relationships on learning behaviors of field-dependent children.

Cohen (1969) has argued that incompatibility of cognitive style may be responsible for many of the learning problems of young children. Cognitive styles can be defined as "pervasive psychological characteristics which cut across intellectual, perceptual, and interpersonal functioning" (More, 1987, p. 18). A theoretical explanation for student preferences for content structure is provided by the cognitive style described as field dependence/independence (Witkin, Moore, Goodenough, & Cox, 1977). Field dependence/independence is the degree to which an individual can distinguish "a figure from its background, a part from the whole, or oneself from the environment and other people" (More, 1987, p. 21). While this may appear to be an abstract psychological distinction, it can be quite influential in designing learning environments which are meaningful and relevant to each child. The disparity which arises when one is required to learn using a non-preferred style has been described by Cohen (1969) as culture conflict.

Culture conflict is of particular concern in subject areas where students are encouraged to analyze concepts cognitively and select salient information from an array of attractive alternatives. As these curricula continue to gain attention in education (Resnick & Klopfer, 1989), teachers and researchers must avoid inadvertently excluding children based on cognitive style. Special subject areas such as physical education, art, and music have also been affected by the recent emphasis on cognitive or analytical curriculum approaches (e.g. Presseisen, 1985). In physical education the emphasis on the understanding of movement concepts is being integrated with the traditional goals of movement performance. Curriculum approaches with this emphasis (e.g. Graham, Holt/Hale, & Parker 1987; Logsdon et al. 1984; Nichols, 1986) have increased the importance of the cognitive focus in

physical education programs for young children. An examination of the learning behaviors associated with cognitive style can assist teachers and other curriculum specialists to address each child's unique learning needs.

This research is based on a naturalistic study conducted in physical education programs taught using the Logsdon et al. (1984) curriculum in two racially integrated elementary schools in the midwestern United States. The focus of the research was the examination of field dependence as it relates to differentiated learning within an analytical concept-based curriculum. The research question centered on the extent to which the analytical cognitive demands of the Logsdon et al. (1984) curriculum would mediate the learning behaviors of field-dependent children. It was hypothesized that the analytical or field-independent nature of the curriculum would require that field-dependent children learn using a non-preferred cognitive style. The mismatch would be evident in behaviors unrelated to the learning task.

The significance of the research lies in the investigation of the effects of cognitive style on learning in actual class settings. Culture conflict results when children are required to learn in an educational environment which is different and at times contradictory to their preferred cognitive style. This presents educational problems both because they do not achieve academically and because they are frequent perpetrators of behaviors which disrupt the academic environment for others. Unfortunately, these children are often handled as discipline problems rather than learning problems. Cognitive styles and the concept of culture conflict provide a less punitive avenue for understanding field-dependent children and for making deliberate changes to address specific manifestations of incompatibility evident in lesson structure and social interactions. The results should have

important implications for preschool, classroom, and special-subject teachers with respect to ways in which curriculum materials or teaching methods might be adapted to meet the needs of students with a field-dependent cognitive style.

Cognitive Style

Characteristics of individuals with field-dependent and field-independent cognitive styles have been described in numerous research studies (e.g. Bertini, Pizzamiglio, & Wapner, 1986; Witkin & Goodenough, 1981; Witkin, Oltman, Cox, Ehrlichman, Hamm, & Ringler, 1973). At the core of field dependence-independence are basic differences in perceptual differentiation and structuring (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962). Characteristics of field-independent and field-dependent learners are summarized in Table 1. Adults and children described as field independent are highly analytical in their approach to a problem. They are able to separate a task into its component parts and examine each independently. These individuals are autonomous and appear to work most comfortably in an independent environment. Criteria for successful performance are derived from the environment itself. Field-independent individuals tend to view the world objectively and to make decisions based on an internal synthesis of relevant factors. They work most effectively in situations where independent analysis requiring extended periods of concentration is necessary for completion of a project or solution of a problem. They tend to have a sense of separate identity with internalized values and standards that permits them to function with a degree of independence of social field (Goodenough, 1976). On the other hand, they may be criticized for their inability to work cooperatively

with others or to relate to others in situations where group discussion is critical to achievement.

Insert Table 1 about here

Conversely, individuals characterized as field dependent are especially effective in situations where collaboration and social relationships contribute to success (Witkin et al., 1962). Cohen (1968) described these individuals as highly relational because they are positively influenced by group goals and derive evaluative criteria from social interaction. Field dependent individuals view the task as a whole without attempting to discern componential distinctions. In perceptual and problem-solving tasks, they assume that the organization of a given background knowledge is correct and do not question the explicit structure (Goodenough, 1976). These individuals are less likely to be successful in situations where they are required to analyze problems independently, concentrate on a problem for an extended period of time, or generate an organizing framework to articulate a concept or solution.

Cohen (1968) argued that highly analytical or field-independent environments are frequently the only learning option offered in schools. She contends that children are required to adapt to this style at an increasingly early age or face the prospect of academic failure. Children's success in acquiring intended classroom knowledge largely depends on their ability to perceive information correctly, that is, the way the teacher intended them to process it (Winnie & Marx, 1982). Indeed, "the student's perceptions of instructional cues and intended cognitive responses can serve as mediating links between the teacher's behavior and the student's learning of curriculum presented by instruction" (Marx, Howard, & Winnie, 1987, p. 132). If these

perceptions are inaccurate, then the child is viewed as either disruptive, nonconforming, or unintelligent. Learning problems are compounded for field-dependent children when they are required to work alone on abstract problems that are difficult to conceptualize. In these instances, criteria for successful performance are based on factual data embedded in teacher explanation or textbook description. Field-dependent or highly relational children progressively find these curricula meaningless and unrelated to the valued aspects of their lives (Cohen, 1968).

In the United States, students with field-dependent cognitive styles represent a variety of cultural and socio-economic backgrounds (e.g. Banks, 1987; Cohen, 1968; Diessner & Walker, 1986; Gonzales & Roll, 1985; Hale-Benson, 1986; Hvitfeldt, 1986; Kagan & Zahn, 1975; More, 1987). In attempts to investigate the origin of this phenomena, researchers (e.g. Cohen, 1968; 1969; Oltman, 1986; Witkin, 1978) have identified relevant social variables such as family and friendship group structure that have been confirmed to some degree cross culturally (Oltman, 1986). More specifically Cohen found that children classified as relational were more likely to lack an organized formal family structure. Regardless of the ethnic origins, individuals within these families were not assigned status roles, but performed critical functions indiscriminately or in a shared manner. Children assumed responsibilities within this cooperative structure. They were not encouraged to make decisions independently nor to play or congregate beyond the confines of the shared family environment.

This highly interdependent, nonautonomous environment is alien to the educational settings typically associated with American schools. Evidence from this and other research has led Cohen to assert that many of the

difficulties that these children experience early in their school careers are manifestations of the phenomenon of culture conflict. Culture conflict refers to "different and/or conflicting conceptual skills between those required by the school and its test instruments and those brought to the school by pupils from shared function primary group environments" (Cohen, 1968, p. 208). While field-dependent or relational children may be superior to field-independent or highly analytical children in their interpersonal and social skills, they are rarely praised or rewarded for these abilities in schools. Instead they may be viewed as disruptive and lacking in the academic skills valued in educational settings.

Therefore the goal of this research was to examine the extent to which the environment created by the analytical curriculum mediated the learning behaviors of field-dependent children. Observations and interviews of teachers and field-dependent children were used to investigate the educational setting in which these factors interact.

Method

Subjects

Children were selected for this study based on scores from the Children's Group Embedded Figures Test (CEFT; Witkin, Oltman, Raskin, & Karp, 1971). Second grade students (n=208) in eight classes at two elementary schools were tested prior to the beginning of the observation period. Scores ranged from 1-24 with higher scores (1st quartile; scores > 17) indicating field independence and lower scores (4th quartile; scores < 9) suggesting field dependence. Students scoring in the 4th quartile (n=52) formed the research sample. Average age of the sample was 7 years, 2 months. A summary of descriptive data reported in Table 2 indicated that 53.8% were female.

Approximately 58% of the children were Caucasian, 28.8% were African-American, 9.6% were Asian (primarily Hmong), and 3.9% were Hispanic.

Insert Table 2 about here

The physical education specialists (n=2) at the two elementary schools were female, Caucasian, and had five and ten years of teaching experience respectively. Each had been recommended by her supervisor and principal as exemplary teachers. Both teachers had been trained in their professional preparation programs to use the Logsdon approach and had continued inservice training with the model through district-sponsored workshops. Both were field-independent with scores of 15 and 17 on the Embedded Figures Test (Witkin, Oltman, Raskin, & Karp, 1971; Maximum score = 18).

Logsdon Curriculum

The Logsdon et al. (1984) curriculum adopted in this district is based on movement principles from the body of knowledge of kinesiology. When this information is developed in a curriculum for children ages 5-11, it is structured as content topics related to four basic movement questions: What can my body do? Where is my body moving? How is my body performing the movement? and What relationships to other people, equipment or boundaries are occurring as I move? (Logsdon et al. 1984). Examples from games, dance, and gymnastics are used to explore and to examine these questions. Lessons are focused to encourage students to address movement questions analytically.

Because young children in physical education programs rarely use workbooks or textbooks, the teacher serves as the principal source of information. Thus children depend on the teacher for content as well as behavioral cues. In

order to be successful, they must attend to the teacher's directions, concentrate on the task to be performed, and compare their performance with the evaluative criteria stated by the teacher. Once the brief discussion portion of the lesson is completed, children are required to remember the directions and discipline themselves to followed through with the prescribed action.

Data Collection

Data in the form of observations and formal interviews of teachers and students were collected by the two investigators over a four month period. Each investigator observed four classes once each week at her assigned elementary school. Data were recorded in two journals. The field note journal consisted of records of events which occurred during the observation period. The interpretive journal consisted of concerns or interpretive comments made by the investigators at a weekly meeting to evaluate the previous weeks' progress and focus the observations for the forthcoming week.

Formal interviews were conducted with teachers and students at the conclusion of the observation period. The one-hour interview with each teacher was structured to include three major topics: her plan for the organization of the class, efforts to structure material for student learning, and perceptions of differences in student learning. Investigators used probes to follow-up formal questioning. An effort was made to encourage the teachers to elaborate their answers with examples from their classes. Field-dependent children were interviewed once during the third month of the observation period. Twenty-six children (50% of the field-dependent sample) were selected in a random sample stratified by gender, race, and school. Interviews were limited to 15 minutes and focused on the children's attitudes toward physical education and the relevance of the content to them. Both

teacher and student interviews were recorded and transcribed for analysis.

In this study both of the researchers were physical educators who had taught in elementary school settings. Because both were offically employed at a university, they were considered outsiders whose role within the school was limited in scope. One of the researchers was Caucausian and the other African, thus increasing their access to some forms of information while limiting others. Efforts were made at weekly meetings to sensitize each investigator to issues of race and culture from the other cultural perspective, thus acknowledging these differences whenever appropriate.

Teachers served as the key informants for this study. Each was selected because of her expertise in the Logsdon curriculum. In this study, access to the school environment was limited to a single investigator in order to preserve the quality of the research setting. Investigators met weekly for three months prior to and during the data collection period to coordinate methods in an effort to collect comparable data. Observation and interview protocols were used to increase the consistency of the data across the research sites. Participant researchers, or individuals within the research setting, assisted by examining the data interpretations (LeCompte & Goetz, 1982). Both teachers assisted the investigators in this way by reviewing data at the conclusion of the study and commenting on its accuracy. Additionally, collaboration between the two researchers served as a form of peer review. Rigorous examinations of the descriptions, interpretations, and conclusions were used to locate discrepancies and facilitate the search for grounded theory.

Data Analysis

Data from the field note and interpretive journals, and interview transcripts were compared and triangulated using constant comparison analysis (Glaser & Strauss, 1967). In this procedure, data were scanned for commonalities or categories. As categories emerged, associated properties were noted and used as rules or definitions for category membership. All statements were then rescanned to ensure compliance with the final category specifications. An effort was made to refine category definitions to the extent that each was mutually exclusive. Each investigator was responsible for the analysis of data from her assigned school. Only those categories which were supported separately in each school and later across the two school situations were included in this report. Additional efforts were made to verify the categories in the literature and to discuss the findings as they related to other research.

Results

Results from this research suggested that the curriculum structure created an environment which was abstract, requiring componential analysis of movement concepts. Field-dependent children experienced difficulty listening to directions and working autonomously. The Logsdon curriculum is an analytical approach to structuring content in which tasks are frequently separated into a series of activities and completed in serial form. Teachers use questioning techniques to direct children's attention to the most important components of content. Criteria for a successful performance are stated explicitly and used by both teachers and students to evaluate the quality of performance.

In lessons observed in this study, new content was introduced in a direct manner with an emphasis on understanding abstract movement concepts as well as the quality of the physical performance. In these instances children were asked to visualize or imagine the product of a verbal set of directions. Eleanor Williams, the teacher at Berkshire Elementary[1], explained the practice session for the concept of sequencing movement to her class:

Eleanor: Girls and boys as you look around the gym you will see bicycle tires, ropes, and benches placed around the room. In our last lesson we practiced jumping in the tires, hopping over the ropes, and galloping across the benches. Today, we are going to use these same movements in sequence. In a sequence, movements follow each other in order. Once you have decided on the order of jumping, leaping, and galloping, you need to remember it so that you can repeat it over and over. Miguel, which movement are you going to try first?

Miguel: Jumping.

Eleanor: What piece of equipment will you use when jumping?

Miguel: Tires.

Eleanor: What will you do next?

Miguel: I will run to a bench and gallop down the bench.

Eleanor: LuAnn, what will Miguel do for the last part of his sequence?

LuAnn: He will hop, because that is the only thing left.

Eleanor: Who can tell me what piece of equipment he will be using? Marcus?

Marcus: The rope.

Eleanor: Alright Miguel show us that sequence. Go through it twice so we can see if you remember it. Boys and girls, watch carefully to be sure he does each task in the correct order (Berkshire, 5876).

From the first days of observation, it was clear that some children were more adept at accomplishing these tasks than others. Some listened with their eyes on the teacher, nodding and responding throughout the ten minute initial presentation. When asked to describe the order or sequence in which tasks were to be completed, they responded quickly usually with the correct answer. These students were frequently called on to answer questions and praised for the accuracy of their responses.

Characteristics of Field-Dependent Behavior

However, many of the field-dependent children within the analytical gymnasium-classroom experienced difficulty attending to directions and working independently. Specifically they had difficulty focusing on the lesson discussion without touching or talking to other students. While they at times raised their hands to answer questions, when called on, they either did not respond or made a comment that was irrelevant to the discussion. When the teacher asked a question regarding prior directions or the serial order of tasks to be completed, they were unable to respond. Teachers described the field-dependent children as inattentive during the beginning class discussions:

> James is my biggest problem in the third period class. He taps his feet and thumps his hands on the floor while the other children and I are trying to talk about the movement. (Williams, 947).

> Most of the children are attentive during our discussion time. But Susan and Laurie have a hard time paying attention. They always seem to be touching other children or each other. They are platting hair or smoothing clothes or just hanging on to each other (Jenkins, 1002).

The practice sections of the class were equally difficult for these students. Correct performance was based on the ability to remember the directions and to work through the tasks in a prescribed sequence. Teacher questions were used as instructional cues to initiate the topic and as follow-up probes to further elaborate student answers (Mahlios, 1981). Questions during this phase of the lesson were directed toward the analysis of movement, focusing the children's attention on the critical parts of the task as they related to and informed the child about the overall movement concept. Content that was familiar and concrete was accessible to field-dependent children. However, as the task became more abstract, and its purpose more obscure, field-dependent children experienced difficulty relating the abstract concept to the prescribed task. This lack of apparent purpose led to instances of off-task behaviors which were disruptive to the educational environment. For example, Pam Jenkins' lesson at Feldon Elementary involving a manual ball dribbling task was initially received with enthusiasm by her second grade students. However, as she refined the task to incorporate

dribbling with different parts of the hand and arm, several students including Ben, had difficulty concentrating on the task:

> Initially Ben was proficient at dribbling or bouncing the ball with his left or right hand and could also dribble with his fingertips, palm, and sides of his hand. However when Pam suggested that students develop a dribbling routine using specific parts of the hand, Ben was unable to do this. At first he watched Peter who was using the palm, back and thumb-side of his hand. Yet, on trying to imitate Peter's routine, Ben lost control of his ball and went racing after it. He then stopped to talk with Dennis and kick Michael's ball which was also rolling out of control. He did not return to his working space, instead paused to look out the window. When the teacher reminded him of the task, he smiled, nodded and once more returned to his work space to practice the movement sequence (Feldon, 2nd, 1975).

When a child deviated from the task, as in Ben's case, the teacher moved into close proximity and spoke directly to that individual. Both Pam and Eleanor spent relatively little time on the problem behavior, choosing instead to refocus the student's attention on the content. These children responded quickly to the teacher and attempted to complete the task. As long as the teacher remained close by and supplied the student with positive and supportive feedback, the child worked deliberately to complete the task:

> Sometimes I look up and there is Hung Chee. I may have left her at the far side of the room working on a task and the next thing I know, she is right beside me (Jenkins, 2213).

> There are some children who just need to be close to me during our instruction time. They prefer to sit by me and then try to choose a working space that is near where I am standing. This is difficult because I try to move around a lot. These students would learn a lot more if they could just learn to work on their own (Williams, 2983).

> David is a good worker as long as I remember to praise him or use his name when I make a correction or give a demonstration. I would really like for him to learn to work alone, but when I leave him, even for a short period he becomes distracted and frequently causes problems that take me away from my instruction (Jenkins, 3468).

During these times, the teacher provided verbal reminders of the serial order of the tasks and the criteria for successful performance. Both teachers continued to question the student regarding the quality of the performance. However, one or more of the other students soon called the teacher away and the pattern of behavior began again with innocuous attention-attracting behaviors followed by more disruptive behaviors which distracted other students.

Interviews with the field-dependent children revealed three concerns indicating that they too perceived a problem in learning within the analytical format. They reported difficulty in remembering directions, dissatisfaction

when working alone, and concerns that the movement tasks were not meaningful. Children expressed concern that they could not remember some part of the lesson:

> Sometimes we go to stations and work on jump rope things. I have trouble remembering what we are supposed to do and which one to do first. It's easier if other children are there too because I can watch them and do what they do (JP, Male (M), Caucasian (C), Feldon, 79).

> After Ms. Williams told us about the obstacle course, Jeff got to go through it and everybody watched. It was fun to watch him go under the benches and jump through the hoops. But later when we were supposed to do it on our own, I forgot which benches to go under and which to jump over (SM, Female (F), African-American (AA), Berkshire, 123).

The teachers in this study frequently provided reminders such as task cards or other cues to help students remember the order or the criteria for a good performance. However, on those occasions when they did not, field-dependent children experienced difficulty with the task. The behaviors discussed earlier by the teachers such as touching other children (hair platting etc.) or foot tapping would suggest a lack of attention. However, there were other children who appeared to be attending and yet could not or did not choose to remember the directions or the criteria for the task.

The second concern mentioned consistently by the children was dissatisfaction with having to work alone:

> Lots of times when you have to work in your own space, you finish and then there isn't anything to do. You can't go over and talk to someone because you are walking out of your own space (LA, M, AA, Berkshire 169).

> I like it best when we work with other children. The rolling games are fun. Yesterday we had four kids in our group. We all had to roll across the mat and back at the same time. Sometimes we crashed together and that was really fun! (FG, M, Asian (AS), Feldon 43).

When working alone, field-dependent students were more easily distracted, at times leaving their task to join other children. The value of the experience was increased when they were permitted to work with others. They stayed involved in the activity, interacting positively with other children. There appeared to be a greater sense of involvement and ownership of the task with field-dependent children working supportively to accomplish group goals.

Children also expressed concerns that they did not know why they had to perform certain tasks. In most instances the teachers had explained the rationale for the task as it related to learning of an abstract movement concept such as striking or vaulting but the explanation lacked relevance to the field-dependent children and was quickly forgotten:

> Today we were hitting the balls with the paddles. We were supposed to keep hitting it against the wall but it was more fun to hit it hard and see how far it would go (MF, M, C, Berkshire 369).

> I don't like to dab...[Dabbing] is when you kick the ball real easy with your foot...[I would rather] kick it ahead and chase it or kick it to someone (LM, F, AA, Feldon 79).

> I wish we didn't have to start vaulting at the lowest bench. I wish we could climb up on the box and just jump off (PC, M, C, Berkshire 109).

The movement concepts which compose the content in the Logsdon curriculum are simplified versions of elements such as force production and balance. Instruction within the approach includes a brief explanation of the phenomenon followed by examples and demonstrations which attempt to make the content relevant. Teachers use questioning to determine the extent to which students understand the concepts. Observations of the classes to which the children were referring in the above comments, indicated that the teachers spent from five to ten minutes explaining the concept and the task to be performed. For example, in the class on vaulting, the vaulting explanation was followed by specific task instructions:

> Now, boys and girls, we have three places for you to vault. Each place has a different height so that some are harder and some are easier. Start with an easy place and try one or two vaults. If you are able to vault over the bench without letting your legs touch the bench and can land on two feet without letting your hand or knee touch the mat, then you can move to the next hardest station. (Berkshire, 4074).

The majority of the children were able to understand the explanation and work successfully on the task. It was not until later, during the interview that the field-dependent child's concerns were expressed.

Discussion

As the data were analyzed, themes and properties emerged to describe major categories of behavior of field-dependent children within the analytical curriculum. Two factors which influenced the learning behaviors of these children were the structure of the class and the opportunities provided for developing interpersonal relationships.

The Role of Structure

Witkin (1978) noted that field-dependent students are less able to structure situations on their own and thus are likely to look to information from others as guides for structuring situations which lack it. Research by Ausubel (1960) and Allen (1970) into the role of advance organizers as structuring devices provides insight into the learning of field-dependent children. Advance organizers are used to assist individuals in the organization of meaningful material. By previewing the topic prior to discussion, the teacher assists the students by generating an explicit structure. When the teachers in this research assisted the field-dependent student individually, they first provided an organizing structure and then asked questions based on that structure.

Satterly and Telfer (1979) found similar results with 14 and 15 year old students. Students classified as field dependent achieved greatest gains when lessons were structured using advance organizers with specific reference to the properties of the organizing concept and how it was to be used to facilitate retention and learning. Additional research by Annis (1979) on

study habits suggested that when the organizing structure was evident in a reading assignment, there was no difference between field-dependent and field-independent eleventh grade students in their ability to respond to comprehension questions. However, when this structure was not immediately evident, the field-independent students were superior in their ability to impose an effective organizational system and deduce accurate responses.

Field-dependent students also require curricula that are structured in concrete terms so that the individual can relate to the problem and find it meaningful. In the analytical curriculum described in this study, the concepts formed an abstract content structure. Children were asked to imagine or mentally visualize aspects of a movement without actually having access to a concrete example. The presentation of class topics by these field-independent teachers was often conducted in abstract terms, requiring auditory memory and visual imaging in order to respond to questions. Although the content and the task were structured for the children by the teacher, the structure itself lacked the concrete focus necessary for it to be utilized by field-dependent children. When these children were told to work on the task individually or to compare their performance with the abstract criteria, they were simply unable to impose an internal structure on the task. Consequently, the field-dependent children redirected their attention to other activities which they found meaningful, but which were unrelated to the content of the lesson.

The teachers selected for this study were chosen based on their expertise using the Logsdon approach. The analytical curriculum appeared to be compatible with their own field-independent cognitive styles. They reported feeling comfortable with the concept-based format and stated that

they experienced no difficulty conveying the complex, abstract content to young children. It is logical to hypothesize that teachers who are especially adept at teaching analytical curricula are more likely to be field-independent, and thus may select presentation formats and teaching styles which inadvertently increase the conflict between the analytical curriculum and the relational or field-dependent children. Additional research is needed to determine the extent to which field-independent teachers can adapt their presentation structures to include field-dependent children, and the extent to which field-dependent teachers are able to mitigate the effects of analytical curricula for field-dependent students.

The Influence of Social Relationships on Learning

Because field-dependent children are less able to structure knowledge on their own, they are likely to depend on information from others as guides to organizing tasks which lack an obvious structure. Because they do not have the internal referents for structuring ambiguous situations that field-independent individuals possess, they experience difficulty working autonomously under these circumstances. Witkin (1978) argued that it is this dependence on others for structuring which encourages field-dependent individuals to develop their capacities for social relationships. In order to receive structural cues from other people, field-dependent individuals selectively attend to social cues in their surroundings. One avenue to receive social cues is by careful attention to the facial expressions of others. This behavior is especially pronounced among field-dependent individuals when they "encounter difficulty with the task confronting them and when the person with whom they are interacting is a likely source of cues in

dealing with the problem at hand" (Witkin, 1978, p. 50). In situations where the task is not perceived to be difficult, the behaviors are not in evidence.

Selective attention is also evident in verbal communication. In experimental studies examining this phenomenon (Witkin & Goodenough, 1977), field-dependent subjects recognized and recalled significantly more words with social connotations than did field-independent subjects. No difference was found in neutral words. This information-seeking behavior is also manifest in associations with others because it facilitates access to information (Witkin, 1978). Similar results were found in research which monitored physical space preferences and verbal behavior associated with the distance of the field-dependent person from the information giver. Field-dependent individuals preferred to be physically near to those with whom they were conversing (Witkin & Goodenough, 1977). When placed at greater distances from the information provider, they demonstrated gestures such as "mouth touching, lip and tongue activity, and palms-up gestures" (Witkin, 1978, p. 53) which Witkin interpreted as reflecting the anxiety of field-dependent individuals working in the non-preferred context.

In this study, interpersonal interactions were evident when observing field-dependent children. Triangulation of data from teacher and student interviews and investigator observations confirmed the importance to field-dependent children of working within close proximity to the teacher and other students and the dissatisfaction experienced when asked to work alone. Because criteria for successful performance and the increase in self-esteem associated with success were derived from other people (Goodenough, 1976), these children depended on social relationships for positive reinforcement. Without the capacity to compare their own performance with objective criteria,

field-dependent children were not just working alone, they were working in isolation. When field-dependent children realized that working with others provided both access to the external structure of the lesson (Witkin, 1978) and an increased level of social comfort, their dissatisfaction with working alone may have intensified.

The centrality of social relationships to the learning process assumed even greater importance when it was associated with the field-dependent child's ethnic heritage. This was evident when observing a small group of Hmong children (n=6) in one second grade class. The Hmongs are the largest ethnic minority in Laos. Following the United States' involvement in Southeast Asia, many Hmongs immigrated to the United States with political asylum. According to Geddes (1976) the major unit of Hmong social organization is the family which is headed by the eldest male and includes all married children and grandchildren. The family works as an economic unit with all property belonging to the household. The eldest male has unlimited authority to make family decisions, settle disputes, and impose punishments. Children learn by observation of parents and elders. Child-rearing emphasizes obedience and adherence to the authority of the family, resulting in a high degree of social conformity.

In this study, Hmong children did not participate initially in the lessons. The individually-oriented tasks, for example, where each child worked alone with a piece of equipment such as a ball, was alien to the working relationships promoted within the culture. The Hmong girls either sat quietly or moved to associate with other Hmong girls. Although the Hmong boys participated with the task, they were frequently observed to wander over to other students (most often other Hmong boys) to demonstrate a new skill or to

talk, or work in closer proximity to a friend. Eleanor and Pam occasionally tried to involve the Hmong girls but were successful only for short periods. In these instances, the Hmong girls would attempt to perform the task and continue as long as the teacher was attending to their activity. Numerous examples of eye contact, physical proximity, and responsiveness to touching were recorded in the data. On occasions where the task called for partner or small group work, the Hmong girls were more involved, although their behavior was frequently not associated with the analytical task. Nevertheless, the teachers were pleased that they were involved and did not intervene to redirect their efforts to the prescribed task. These findings support those of Hvitfeldt (1986) with Hmong adults. She found collaborative teaching styles to be a critical factor when teaching adult Hmong students.

In summary, field-dependent children were more likely to be involved in the learning process when the task was concrete and explained with a demonstration or an example which was meaningful. The opportunity for social interaction not only increased the comfort and enjoyment level of field-dependent children, but also encouraged the presence of content-related behaviors associated with student learning. As the number of minority and low income students continues to increase in schools, it is imperative that teachers and curriculum coordinators consider the differences in cognitive style which may influence the success and failure of these children. By anticipating that field-dependent children will have specific learning problems in an analytical curriculum, teachers can plan strategies which both include the field-dependent child in the educational process and assist them to function more analytically.

Note 1: The names of schools, students, and teachers have been changed to maintain confidentiality.

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Table 1

Behavioral Profiles of Field-dependent and Field-independent Learners[a]

Field Independent	Field Dependent
1. Approach problems analytically	1. Approach problems in relational or social mode
2. Stimulus centered	2. Person centered
3. Focus is on parts of object	3. Focus on global characteristics of object
4. Ability to perceive abstract, obscure, nonobvious features	4. Perception of obvious or clearly stated features
5. Ability to impose internally constructed framework to organize information	5. Adept at using relational skills to acquire structuring framework from others
6. High ability to detect change in monotonous, but constantly changing perceptual field over long period of time	6. Low ability to detect changes in a monotonous constantly changing perceptual field
7. Long attention/concentration span (not easily distracted)	7. Short attention/concentration span (easily distracted)
8. Perceives teacher as information source	8. Perceives teacher as individual
9. Prefers nonsocial learning environment	9. Prefers social learning environment
10. Criteria for acceptable performance based on internal analysis and synthesis of available information	10. Criteria for acceptable performance based on consensus of social group, observation of others, or other social interaction

[a]Characteristics compiled from profiles developed by Cohen (1969), Hale-Benson (1986), and Witkin (1978)

Table 2

Descriptive Data for Field-Dependent Children

Type of data	n	Frequency (Percentage)
Gender of child		
Female	28	53.8
Male	24	46.1
Race		
African-American	15	28.8
Asian	7	9.6
Caucasian	28	57.7
Hispanic	2	3.9